

Abstract of the Disclosure

A thermal barrier coating with unique properties suitable for high temperature thermal insulation control on a substrate is provided. The coating is thermally sprayed, consisting of three layers: 1) a MCrAlY bond coat (basecoat), 2) an intermediate crack resistant ceramic coating, and 3) a top coat of yttria stabilized zirconia. The three layer coating is deposited, preferably, using an air plasma spray system with suitable macro cracks in the top coat, with an underlying crack resistant layer, to enable the ceramic top coat to have properties suitable for advanced gas turbine thermal barrier coatings.